Table1 Identification results of serum biomarkers in YHS group

NO	Rt	m/z determined	m/z calculated	Error （mDa）	Ion form	Molecular Formula	Metabolite Name	Trend	T'TEST
1	8.73	772.5930	771.5778	0.189	$[M+H]^+$	$C_{43}H_{82}NO_8P$	PC(15:0/20:2(11Z,14Z))	↓	$1.594\times E^{-3}$
2	0.60	130.0499	129.0426	0.486	$[M+H]^+$	$C_5H_7NO_3$	Pyroglutamic acid	↓	$1.654\times E^{-2}$
3	2.20	249.1251	248.1161	2.912	$[M+H]^+$	$C_{13}H_{16}N_2O_3$	6-Hydroxymelatonin	↑	$4.540\times E^{-5}$
4	6.25	546.3539	545.3481	-2.775	$[M+H]^+$	$C_{28}H_{52}NO_7P$	LysoPC(20:3(5Z,8Z,11Z))	↓	$1.466\times E^{-6}$
5	8.19	512.5064	511.4964	3.141	$[M+H]^+$	$C_{32}H_{65}NO_3$	Cer(d18:0/14:0)	↓	$6.952\times E^{-9}$
6	8.78	719.5690	718.5536	-1.355	$[M+H]^+$	$C_{47}H_{74}O_5$	DG(22:4(7Z,10Z,13Z,16Z)/22:5(4Z,7Z,10Z,13Z,16Z)/0:0)	↓	$1.981\times E^{-2}$
7	1.98	194.0794	193.0739	-0.035	$[M+H]^+$	$C_{10}H_{11}NO_3$	Phenylacetylglycine	↑	$4.578\times E^{-3}$
8	2.23	411.2492	410.2433	-3.366	$[M+H]^+$	$C_{19}H_{39}O_7P$	LPA(0:0/16:0)	↑	$4.933\times E^{-2}$
9	2.69	121.0649	120.0575	0.960	$[M+H]^+$	C_8H_8O	Phenylacetaldehyde	↑	$4.446\times E^{-3}$
10	3.06	136.0761	135.0684	2.714	$[M+H]^+$	C_8H_9NO	2-Phenylacetamide	↑	$2.989\times E^{-2}$
11	8.31	556.5300	555.5227	0.128	$[M+H]^+$	$C_{34}H_{69}NO_4$	Cer(t18:0/16:0)	↑	$5.923\times E^{-3}$
12	8.89	770.5690	769.5622	-0.541	$[M+H]^+$	$C_{43}H_{80}NO_8P$	PC(15:0/20:3(5Z,8Z,11Z))	↓	$1.618\times E^{-2}$
13	2.25	758.5692	757.5622	-0.306	$[M+H]^+$	$C_{42}H_{80}NO_8P$	PC(14:0/20:2(11Z,14Z))	↑	$3.516\times E^{-3}$
14	5.46	224.0562	223.0481	3.917	$[M+H]^+$	$C_{10}H_9NO_5$	4-(2-Amino-3-hydroxyphenyl)-2,4-dioxobutanoic acid	↑	$2.124\times E^{-7}$
15	6.99	538.3877	537.3794	1.885	$[M+H]^+$	$C_{27}H_{56}NO_7P$	LysoPE(0:0/22:0)	↓	$1.504\times E^{-2}$
16	1.72	209.0939	208.0848	-1.470	$[M+H]^+$	$C_{10}H_{12}N_2O_3$	Formyl-5-hydroxykynurenamine	↑	$3.473\times E^{-4}$
17	2.32	185.0827	184.0736	2.899	$[M+H]^+$	$C_9H_{12}O_4$	Vanylglycol	↑	$2.157\times E^{-3}$
18	8.34	802.6350	801.6248	4.570	$[M+H]^+$	$C_{45}H_{88}NO_8P$	PC(15:0/22:1(13Z))	↓	$1.049\times E^{-3}$
19	1.90	163.0383	164.0473	1.601	[M-H]-	$C_9H_8O_3$	Phenylpyruvic acid	↑	$3.070\times E^{-4}$

20	1.98	193.0349	194.0427	-2.627	[M-H]-	$C_6H_{10}O_7$	D-Glucuronic acid	↑	$4.211\times E^{-2}$
21	8.49	790.5418	791.5465	3.185	[M-H]-	$C_{45}H_{78}NO_8P$	PC(15:0/22:6(4Z,7Z,10Z,13Z,16Z,19Z))	↑	$4.768\times E^{-2}$
22	6.19	480.3096	481.3168	0.038	[M-H]-	$C_{23}H_{48}NO_7P$	LysoPC(15:0)	↓	$1.101\times E^{-2}$

↑ : YHS vs Control; ↓ : YHS vs Control

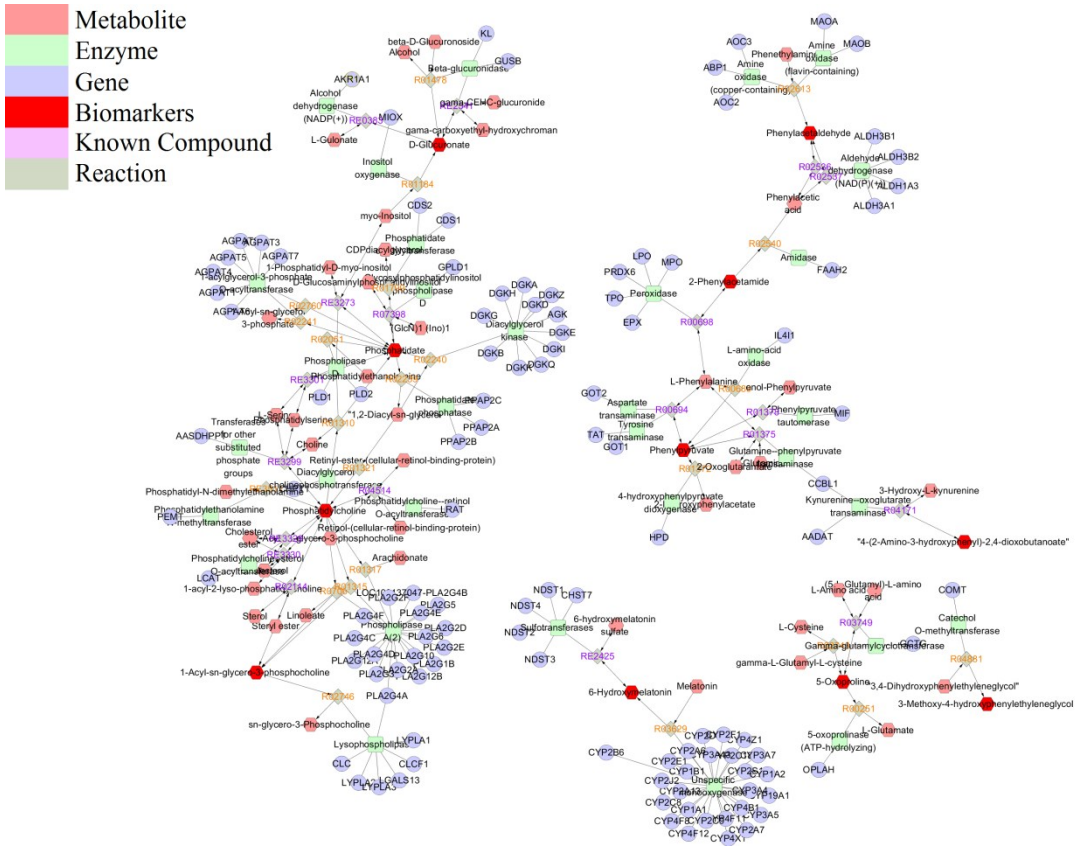

Fig. S1 Construction of the altered metabolic network associated YHS mice based on KEGG pathway database.